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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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RICHMOND, HITCHCOCK, FISH & DOLLAR
P.O. Box 2443
Bartlesville, OK 74005

EXAMINER

GRIFFIN, WALTER DEAN

ART UNIT PAPER NUMBER

1764

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,821

Applicant(s)

HOOVER ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-106 is/are pending in the application.
- 4a) Of the above claim(s) 48-96 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-47 and 97-106 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

The claim objection and the claim rejections described in the office action mailed on July 14, 2005 have been withdrawn in view of the amendment filed on October 13, 2005. The Tate reference does not disclose an apparatus that includes a regenerator receiver and the Thompson reference has been disqualified as prior art.

New rejections follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4-19, and 25-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) in view of Schwartz (US 4,473,658).

The Tate reference discloses an apparatus that comprises a fluidized bed reactor, a fluidized bed regenerator, and a fluidized bed reducer that is close-coupled to the reactor. There is a straight, open passageway between the reducer and reactor. A stripper is also close coupled to the reactor and is connected to the reactor by a straight, open passageway. The apparatus contains transport assemblies for transporting solids from the reactor to the regenerator, for transporting solids from the regenerator to the reducer, and for transporting solids from the reducer to the reactor. While the apparatus is not disclosed as a desulfurization apparatus, the apparatus of Tate is capable of being used as a desulfurization unit. See column 2, line 53 through column 4, line 14.

The Tate reference does not disclose the presence of a regenerator receiver in the apparatus. The Tate reference also does not disclose that the reducer solids outlet and the reactor solids inlet are spaced less than about 3.0 m from one another, does not disclose that the reactor solids outlet and stripper solids inlet are spaced less than about 3.0 m from one another, and does not disclose the claimed characteristics of the passageway between the reactor and stripper or the passageway between the reducer and reactor. The Tate reference also does not disclose the relative locations of the vessels, the inlets, the outlets, etc.

The Schwartz reference discloses an apparatus that contains a regenerator and a catalyst cooler coupled to the regenerator. The catalyst cooler is equivalent to the claimed regenerator

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receiver. See column 5, lines 15-20.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Tate by including a catalyst cooler (i.e., regenerator receiver) coupled to the regenerator as suggested by Schwartz because including this in the apparatus of Tate would allow one to control the temperature of the hot solids.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Tate by spacing, sizing, and orienting the apparatus including the inlets and outlets as claimed because one would adjust such features based on space availability and desired capacity.

Claims 20-24 and 34-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) in view of Schwartz (US 4,473,658) as applied to claims 6 and 25 above, and further in view of Micklich (US 5,716,516).

The previously discussed references do not disclose an apparatus that includes lock hoppers.

The Micklich reference discloses that receivers and lock hoppers are conventionally used in processes that involve the transporting of particulates from one vessel to another. See column 7, line 60 through column 8, line 18.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by utilizing lock hoppers as suggested by Micklich because such units are conventionally used and permit the transporting of particles from one environment to another.

Regarding the relative locations of the apparatus components, it would have been obvious

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to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the references to have an apparatus with the claimed relative locations because one would utilize gravity to assist in the flow of the solids. Therefore, the relative locations of the components of the apparatus are dictated by the flow path of the solids.

Claims 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) in view of Micklich (US 5,716,516).

As discussed above, the Tate reference does not disclose an apparatus that includes lock hoppers.

The Micklich reference discloses that receivers and lock hoppers are conventionally used in processes that involve the transporting of particulates from one vessel to another. See column 7, line 60 through column 8, line 18.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by utilizing lock hoppers as suggested by Micklich because such units are conventionally used and permit the transporting of particles from one environment to another.

Claims 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) in view of Micklich (US 5,716,516) as applied to claim 42 above, and further in view of Schwartz (US 4,473,658).

The previously discussed references do not disclose the presence of a regenerator receiver in the apparatus.

The Schwartz reference discloses an apparatus that contains a regenerator and a catalyst cooler coupled to the regenerator. The catalyst cooler is equivalent to the claimed regenerator

receiver. See column 5, lines 15-20.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by including a catalyst cooler (i.e., regenerator receiver) coupled to the regenerator as suggested by Schwartz because including this in the apparatus of Tate would allow one to control the temperature of the hot solids.

Claims 97, 100, 101, and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248).

The Tate reference discloses an apparatus that comprises a fluidized bed reactor, a fluidized bed regenerator, and a fluidized bed reducer that is close-coupled to the reactor. There is a straight, open passageway between the reducer and reactor. A stripper is also close coupled to the reactor and is connected to the reactor by a straight, open passageway. While the apparatus is not disclosed as a desulfurization apparatus, the apparatus of Tate is capable of being used as a desulfurization unit. See column 2, line 53 through column 4, line 14.

The Tate reference does not disclose that the conduit between the reactor and stripper is substantially horizontal, does not disclose that the stripper inlet is the only opening in the stripper located above the gas inlet and solids outlet, and does not disclose the claimed characteristics of the passageway between the reactor and the stripper.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Tate by sizing and orienting the conduit between the reactor and stripper as claimed because one would adjust such features based on space availability and desired capacity.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Tate by having the stripper inlet be the only opening in the stripper located above the gas inlet and solids outlet because such a configuration would allow the stripping gas to be returned to the reactor through the solids passageway instead of the additional line of Tate thereby simplifying the apparatus and reducing costs associated with the construction of the apparatus.

Claims 98 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) as applied to claim 97 above, and further in view of Winter (US 2,609,249).

As discussed above, the Tate reference does not disclose a sparger in the conduit.

The Winter reference discloses a conduit for passage of solids. The conduit contains a jet pipe (i.e., sparger) for introducing gas into the conduit to control the flow of solids. The jet pipe may be directed at an angle to the conduit. See column 1, lines 38 through column 2, line 10 and column 3, lines 22-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Tate by including a jet pipe in the conduit between the reactor and stripper as suggested by Winter because the use of the jet pipe helps control the flow of solids. Regarding the angle of the jet pipe, it would have been obvious to one having ordinary skill in the art at the time the invention was made to angle the pipe downwardly because Winter discloses that the pipe may be directed at an angle to the conduit. Therefore, the use of a downward angled pipe would also be expected to provide control of solids flow.

Claim 103 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) as applied to claim 97 above, and further in view of Schwartz (US 4,473,658).

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As discussed above, the Tate reference does not disclose a regenerator receiver.

The Schwartz reference discloses an apparatus that contains a regenerator and a catalyst cooler coupled to the regenerator. The catalyst cooler is equivalent to the claimed regenerator receiver. See column 5, lines 15-20.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Tate by including a catalyst cooler (i.e., regenerator receiver) coupled to the regenerator as suggested by Schwartz because including this in the apparatus of Tate would allow one to control the temperature of the hot solids.

Claims 104 and 105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) in view of Schwartz (US 4,473,658) as applied to claim 103 above, and further in view of Micklich (US 5,716,516).

Neither the Tate nor the Schwartz reference discloses a regenerator lock hopper and the relative locations of the regenerator receiver, reducer, and lock hopper.

The Micklich reference discloses that receivers and lock hoppers are conventionally used in processes that involve the transporting of particulates from one vessel to another. See column 7, line 60 through column 8, line 18.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by utilizing lock hoppers as suggested by Micklich because such units are conventionally used and permit the transporting of particles from one environment to another.

Regarding the relative locations of the regenerator receiver, reducer, and lock hopper, it would have been obvious to one having ordinary skill in the art at the time the invention was

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made to have modified the teachings of the references to have an apparatus with the claimed relative locations because one would utilize gravity to assist in the flow of the solids. Therefore, the relative locations of the components of the apparatus are dictated by the flow path of the solids.

Claim 106 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tate et al. (US 2,873,248) as applied to claim 97 above, and further in view of Micklich (US 5,716,516).

The Tate reference does not disclose a reactor lock hopper and the relative location of the stripper and lock hopper.

The Micklich reference discloses that receivers and lock hoppers are conventionally used in processes that involve the transporting of particulates from one vessel to another. See column 7, line 60 through column 8, line 18.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by utilizing lock hoppers as suggested by Micklich because such units are conventionally used and permit the transporting of particles from one environment to another.

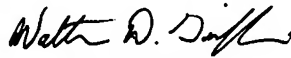
Regarding the relative locations of the stripper and lock hopper, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the references to have an apparatus with the claimed relative locations because one would utilize gravity to assist in the flow of the solids. Therefore, the relative locations (i.e., elevations) of the components of the apparatus are dictated by the flow path of the solids.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on M-F 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Walter D. Griffin
Primary Examiner
Art Unit 1764

WG
December 13, 2005